

REMARKS

The undersigned attorney has taken over the prosecution of the subject application. A Revocation of Power of Attorney With New Power of Attorney appointing the undersigned attorney as the attorney of record was filed on December 22, 2004.

Applicant would like to thank the Examiner for the careful consideration the Examiner has given the present application. Prior to this Amendment "C", claims 1-31 were pending in the present application. In this Amendment "C", Applicant has canceled claims 1-31 and has added new claims 32-49, with claims 32, 38 and 44 being independent. Claims 36, 42, 46 and 47 do not read on the elected embodiment 1 (Figs. 1 and 2). All of the remaining claims read on the elected embodiment 1. Claims 32, 33, 34, 37, 38, 39, 40, 43, 44, 48 and 49 are generic to embodiments 1-5. Reconsideration of the application in its current format is hereby requested.

In the Office action, the Examiner has: (1.) rejected claims 1, 4, 6, 8-12, 14-15 and 30-31 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,711,266 to **Leiber** in view of U.S. Patent No. 6,816,048 to **Morita et al.**; (2.) rejected claims 18, 26 and 28 as being unpatentable over the Leiber patent and the Morita et al. patent and further in view of U.S. Patent No. 4,664,136 to **Everett**; (3.) rejected claims 19-20 under 35 U.S.C. §103(a) as being unpatentable over the Leiber patent and the Morita et al. patent and further in view of U.S. Patent No. 3,545,472 to **Franz**; (4.) rejected claims 21-25 under 35 U.S.C. §103(a) as being unpatentable over the Leiber patent and the Morita et al. patent and further in view of U.S. Patent No. 3,022,450 to **Chase, Jr.**; and (5.) rejected claim 27 under 35 U.S.C. §103(a) as being unpatentable over the Leiber patent and the Morita et al.

patent and further in view of U.S. Patent No.6,125,803 to **Hattori et al.** Thus, the Examiner has rejected each of claims 1-31 based on the combination of the **Leiber** patent and the **Morita et al.** patent alone or in further combination with one of the **Everett '136** patent, the **Franz** patent, the **Chase, Jr.** patent and the **Hattori et al.** patent. For at least the reasons set forth below, Applicant submits that new claims 32-48 are patentable over these combinations of references.

The **Leiber** patent discloses a valve arrangement comprising a valve and an electromagnet 1. The valve includes a valve closing body or ball 11 and fluid line connections 13-15. A spring biases the ball 11 toward an open position. The electromagnet 1 has a cup-shaped stator 3 with an open end. A coil 2 is mounted inside the stator 3 and an armature 4 is disposed in the open end of the stator 3, above the coil 2. A portion of the armature 4 is disposed exterior to the stator 3. **Leiber** patent does not disclose using a permanent magnet. In addition, and as is clearly shown in Fig. 1, the armature 4 does not extend radially outward as far as the coil 2.

The **Morita et al.** patent discloses an electromagnet 10 having a movable core 1, a stationary core 2, a coil 3 and a permanent magnet 12 disposed above the coil 3. The movable core 1 includes a disc-like steel plate 6. In an embodiment shown in Figs. 1-5, a portion of the steel plate 6 is disposed exterior to the stationary core 2, but the steel plate 6 does not form an outwardly-extending gap with the stationary core 2. In another embodiment shown in Fig. 6, a pipe 15 is secured to the stationary core 2 and is closed with a lid 7. The steel plate 6 is disposed inside the pipe 15 and forms an outwardly-extending gap with the pipe 15 and a longitudinally-extending gap with the permanent magnet 12. As is shown, in Fig. 6, however, the steel plate 6 does not extend outward farther than the coil 3.

The Everett '136 patent discloses an electromagnetic actuator 12 with a housing 32 enclosing an armature 78. The Everett '136 patent fails to disclose a permanent magnet

The Franz patent discloses a solenoid assembly 49 with a housing 52 enclosing a sole plate 67. Although the Franz patent discloses the sole plate 67 as being "magnetic", it is clear that this term is being used to mean magnetically permeable and not permanently magnetized. The Franz patent fails to disclose a permanent magnet.

The Chase, Jr. patent discloses a solenoid having a pair of coils 34, 36 and an armature 24 enclosed within a housing 10. An annular permanent magnet 38 is disposed between the coils 34, 36. A cylindrical armature 24 is fully disposed within an axial opening extending through the coils 34, 36 and the magnet 38.

The Hattori et al. patent discloses an electromagnetically-driven valve 10 having fixed upper and lower cores 32, 34 with upper and lower coils 40, 42, respectively. A core guide 48 surrounds the upper and lower cores 32, 34 to define a cavity, within which an armature 30 is movably disposed. The Hattori patent fails to disclose a permanent magnet.

Initially, Applicant submits that the Examiner has failed to provide adequate motivation to combine the Leiber patent and the Morita et al. patent. In combining the Leiber patent and the Morita et al. patent, the Examiner states (with emphasis added): "It would have been obvious to one of ordinary skill in the art..... to include a permanent magnet..... for the purpose of **providing latching** and/or reducing necessary activation forces." As is acknowledged by the Examiner and expressly taught by the Morita et al. patent (see column 6, lines 41-60), a permanent magnet is provided to latch an armature in an activated position, i.e., proximate to a coil. In

order to release the armature and permit the armature to move to a deactivated position, i.e., distal to the coil, a reverse current must be applied to the coil (see column 6, lines 51-60 of the Morita et al. patent). Thus, if the armature is in the activated position and no current is supplied to coil, the armature will remain in the activated position (see column 6, lines 41-50 of the Morita et al. patent). This operation, however, would cause the monitoring circuit disclosed in Fig.3 of the Leiber patent to operate improperly because the monitoring circuit assumes that the armature 4 moves to the deactivated position when the current is cut off to the coil 2. More specifically, if a permanent magnet is added to the electromagnet 1 of the Leiber patent (as advocated by the Examiner) and the current to the coil 2 is cut off. when the armature 4 is in the activated position, the armature 4 remains in the activated position. As a result, the activation signal at terminal 35 is "0" and the sensor signal at terminal 35 is "0", which causes the signal at the output of the inverted AND gate 38 and, thus, the signal at the OR gate 39 to be a "1", thereby activating the warning light 40. Thus, the warning light 40 gives a false indication of trouble. Since the proposed addition of a permanent magnet to the electromagnet 1 of the Leiber patent would cause the monitoring system to be unsatisfactory for its intended purpose, Applicant respectfully submits that there is no motivation to combine the Leiber patent and the Morita et al. patent as the Examiner has done. As set forth in MPEP §2143.01, "If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Even if the Leiber patent and the Morita et al. patent are combined as advocated by the Examiner, the combination fails to show independent claims 32,

38 and 44.

With regard to claim 32, the Leiber patent fails to show a permanent magnet and the Morita et al. patent shows a permanent magnet disposed outside an axial passage of a coil. Thus, the Leiber patent and the Morita individually and in combination fail to show or suggest (with emphasis added): an "electromagnetic actuator" with a "solenoid coil having an axial passage" and a "*permanent magnet disposed in the axial passage of the solenoid coil*", as is presently recited in independent claim 32. Since the Everett '136 patent, the Franz patent and the Hattori et al. patent all fail to disclose a permanent magnet and the Chase, Jr. patent shows a permanent magnet disposed outside axial passages of coils, it is clear that the Everett '136 patent, the Franz patent, the Hattori et al. patent and the Chase, Jr. patent all fail to cure the foregoing deficiencies of the Leiber patent and the Morita patent. Accordingly, Applicant submits that independent claim 32 and, thus, dependent claims 33-37 are patentable over the cited references.

With regard to claim 38, the Leiber patent fails to show a permanent magnet, let alone a permanent magnet fully disposed in a housing. In addition, the Leiber patent fails to show an armature that extends outward farther than a coil. The Morita et al. patent (Fig. 6) discloses a permanent magnet fully disposed in a housing, but fails to show such a permanent magnet in conjunction with an armature that extends outward farther than a coil, i.e., a coil with an outer periphery disposed inward from a periphery of an armature. Thus, the Leiber patent and the Morita patent, individually and in combination, fail to show or suggest (with emphasis added): a "solenoid coil" having an "outer periphery" which is "*disposed inward from the outer peripheral surface of the armature*", as is presently recited in independent claim 38. Since the Everett '136 patent, the Franz patent and the Hattori et al. patent all fail to

disclose a permanent magnet and the Chase, Jr. patent shows an armature fully disposed within axial passages of coils, it is clear that the Everett '136 patent, the Franz patent, the Hattori et al. patent and the Chase, Jr. patent all fail to cure the foregoing deficiencies of the Leiber patent and the Morita patent. Accordingly, Applicant submits that independent claim 38 and, thus, dependent claims 39-43 are patentable over the cited references.

With regard to claim 44, the Leiber patent discloses an armature partially disposed exterior to a housing, but the armature does not extend outward farther than a solenoid coil. In addition, the Leiber patent fails to disclose a spring in the housing. The Morita et al. discloses an armature that extends outward farther than a solenoid coil, but the armature does not form an outwardly-extending gap with a housing. In addition, the Morita et al. patent also fails to disclose a spring in the housing. Thus, the Leiber patent and the Morita et al. patent, individually and in combination, fail to show or suggest (with emphasis added): "*a spring disposed in the cavity*" and "*an armature **at least partially disposed exterior to the housing***", wherein the armature has "*an outer peripheral surface, **which is disposed outward from the outer periphery of the solenoid coil***" as is presently recited in independent claim 44. Since the Everett '136 patent, the Franz patent, the Hattori et al. patent and the Chase, Jr. patent all disclose armatures fully enclosed within housings, it is clear that that the Everett '136 patent, the Franz patent, the Hattori et al. patent and the Chase, Jr. patent all fail to cure the foregoing deficiencies of the Leiber patent and the Morita patent. Accordingly, Applicant submits that independent claim 44 and, thus, dependent claims 45-49 are patentable over the cited references.

Based on the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby

requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 050877.

Respectfully submitted,

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